

## **Table of Contents**

### Preface

## **Chapter 1: Mechanics of Materials and Tribology Research**

### **Bond-Based Peridynamic Model for Tensile Deformation and Fracture of Polycarbonate and Polypropylene**

M.A. Azizi, M.A. Azman, M.F.A. Norazak and M.A.H. Fauzi 3

### **Investigation of Strength Concrete Materials Using Pozzolanic Additives**

A. Yusra, M. Hasan, T.B. Aulia and F. Fachruddin 23

### **Development of a Cost-Effective Twin-Disc Test Rig for Railway Wear Simulation**

T.P. Leso, C.W. Siyasiya, R.J. Mostert and J. Moema 35

## **Chapter 2: Advanced Materials Processing**

### **Dielectric Fluids for the Electrical Discharge Machining: A Review**

K. Kunal, K.P. Singh and M.Y. Khan 55

### **Powder Bed Fusion Techniques in Metal 3D Printing: A Review**

R. Khan, I. Rasool, M. Afzal and A.A. Khan 67

### **Optimization of Machining Process on Coated Tungsten Carbide Electrode Tool and Titanium Alloy Workpiece Using EDM: A Critical Review**

N.K. Singh, P.S. Rao and K. Saidaiah 77

## **Chapter 3: Machining Tools**

### **Forging Die Wear Optimization: A Combined Approach with Finite Element Analysis and Taguchi Methodology**

M.I. Eqbal, A. Saood and V.M.S. Hussain 89

### **Thermal Analysis of Micro-Channel Internal Cooling in Cutting Tools: A Machine Learning Approach**

A. Abid, S.M. Hamza, M.K. Alim, M. Muaz, S. Hussain and S. Arif 97

## **Chapter 4: Mechatronics**

### **Finite Element Analysis and Optimization of the Piezoelectric Circular Diaphragm Energy Harvester**

V.D. Le 111

### **Malaysian Rainwater Harvesting System for In-House Power Generation**

F.B. Ismail, M.I. Fahmy, A.M. Abed, H.A. Kazem, M.T. Chaichan and M.A.A. Rahmat 123

### **Experimental Study and Performance Analysis of Thermoelectric Cooler Using Solar Photovoltaic Energy**

N.A.H. Ali Taher and A.A.F. Al-Hamadani 135